PIUTE RESERVOIR

Introduction

Piute Reservoir is at the north end of Circle Valley, north of Circleville and south of Marysvale. It is a large, shallow impoundment of a low elevation valley.

The reservoir shoreline is publicly/privately owned and administered by the BLM and the Piute Reservoir and Irrigation Company with unrestricted public access. Defined beneficial uses include: water recreation excluding swimming; propagation of cold water species of game fish and aquatic life; and agricultural needs.

Characteristics and Morphometry

Lake elevation (meters / feet)	1,828 / 5,996
Surface area (hectares / acres)	1,015 / 2,508
Watershed area (hectares / acres)	558,000
Volume (m^3 / acre-feet)	
capacity	88,957,508 / 71,826
conservation pool	none
Annual inflow (m^3 / acre-feet)	
Retention time (years)	
Drawdown (m^3 / acre-feet)	68,248,797 / 55,329
Depth (meters / feet)	
maximum	20 / 66
mean	10 / 33
Length (km / miles)	11.1 / 6.9
Width (km / miles)	1.4 / .9
Shoreline (km / miles)	28.6 / 17.8

Recreation

Location

County	Piute
Longitude / Latitude	112 12 26 / 38 17 22
USGS Maps	Piute Reservoir, Utah 1981
Cataloging Unit	Upper Sevier (16030001)

Piute Reservoir is directly accessible from Piute Reservoir State Park located on US-89 between Marysvale and Junction.

Fishing is the primary activity but waterskiing, swimming, boating, waterfowl hunting, picnicking and camping are also possible. Usage is moderate.

Piute Reservoir State Park, located at the north end of the lake, has limited recreational facilities. The low precipitation and consequent sagebrush vegetation is not noted for its scenic beauty. Primitive camping on BLM land

File Contains Data for PostScript Printers Only

is the only camping available at the reservoir. There are private campgrounds available in Junction, Circleville and at the Big Rock Candy Mountain, about 12 miles north on US-89. There is a public campground at the Otter Creek State Park a few miles to the east.

Watershed Description

The reservoir is in the north end of Circle Valley, between the Tushar Mountains and the Sevier Plateau. It is located where the Sevier River from the south and the East Fork of the Sevier River from the east converge.

Circle Valley is a bowl-shaped valley with a lobed extension to the north, in which the reservoir is located. The Tushar Mountains, over 12,000' tall, provide a stunning backdrop for Piute Reservoir. The area immediately surrounding the reservoir is lacking in traditional scenic beauty, being a sagebrush rangeland.

The watershed high point, The Fish Lake Hightop Plateau, is 3,546 m (11,633 ft) above sea level, thereby developing a complex slope of 3.6% to the reservoir. Panguitch Lake is an upstream impoundment on the Sevier River, and Otter Creek Reservoir is an upstream impoundment on the East Fork Sevier River. The outflow is the Sevier River. The average stream gradient is 1.3 (69 feet per mile) for both watersheds. In the Otter Creek Drainage the average slope is 2.1% (109 feet per mile) and in the East Fork Sevier drainage it is 0.8% (45 feet per mile).

The soil in the surrounding high country is derived from the underlying volcanic rocks, and the soil in the vicinity of the reservoir is made up of alluvial deposits from the high country.

The vegetation communities are comprised of bitterbrush-mountain mahogany, pinion-juniper, sage-grass, pine, aspen, spruce-fir, oak and maple. The watershed receives 20 - 102 cm (8 - 40 inches) of precipitation annually with a frost-free season of 100 - 1400 days at the reservoir. Land use in the watershed is 92.3% multiple use, 6.2% pasture and hayland, 1.3% cropland, and the remainder urban and recreation. Although some of the shoreline is privately owned, public accessibility is unrestricted.

Limnological Assessment

The water quality of Piute Reservoir is good. It is considered to be hard with a hardness concentration value of approximately 198 mg/L (CaCO3). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus and dissolved oxygen. The average concentration of total phosphorus in the water column for the three study periods was 38, 41 and 64 ug/L which all exceed the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the second period of sampling are usually higher as the level of the reservoir diminishes and resuspension of nutrients from the sediments occurs due to mixing by wave action and wind. Dissolved oxygen concentrations decrease in late summer due to the shallow nature of the reservoir and production of algae.

Although in 1981 the reservoir was characterized as a phosphorus limited system, the 1989-91 data suggest that the reservoir is currently a nitrogen limited system. In the 1975 NES report the reservoir was characterized as phosphorus limited in May, but shifting to nitrogen limitation later in the year. TSI values indicate the reservoir is eutrophic. The reservoir does have sufficient depth to stratify as indicated in the August 13, 1991 profile, but in recent years due to lower storage and early drawdown, the reservoir did not stratify.

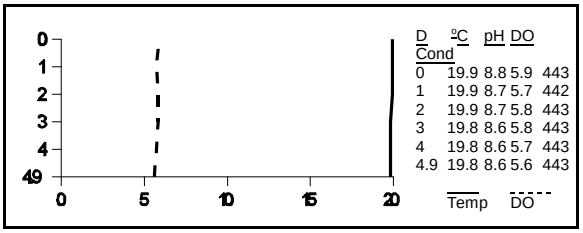
According to DWR reports no fish kills have been reported in recent years. In a 1975, DWR reported that the composition of the fishery in the reservoir was rainbow trout (*Oncorhynchus mykiss*) (0.8%), brown trout

Limnological Data

Data averaged from STORET sites: 494916, 494917, 494918

Surface Data	1979	1989	1991
Trophic Status	E	E	E
Chlorophyll TSI	62.29	53.74	41.10
Secchi Depth TSI	50.00	58.89	58.76
Phosphorous TSI	57.40	58.91	63.48
Average TSI	56.56	57.18	54.45
Chlorophyll a (ug/L)	-	9.0	3.3
Transparency (m)	2.0	1.98	1.1
Total Phosphorous (mg/L)	34.8	39	63
pH	8.6	8.5	8.6
Total Susp. Solids (mg/L)	2	-	22
Total Volatile Solids (mg/L)	-	-	6
Total Residual Solids (mg/L)	-	-	21
Temperature (°C / °f)	12/54	19/65	18/64
Conductivity (umhos.cm)	363	494	449
Water Column Data			
Ammonia (mg/L)	0.06	0.03	0.04
Nitrate/Nitrite (mg/L)	0.13	-	0.08
Hardness (mg/L)	194	-	201
Alkalinity (mg/L)	211	-	206
Silica (mg/L)	24	-	33
Total Phosphorous (ug/L)	38	41	64
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	6.5	6.8	5.7
Stratification (m)	NO	NO	NO
Depth at Deepest Site (m)	10	7.0	4.9

(*Salmo trutta*) (0.2%), Utah chub (*Gila atraria*) (80%), Utah sucker (*Catostomus ardens*) (14%), carp (*Cyprinus carpio*) (3%), redside shiner (*Richardsonius balteatus*) (1.2%), and cutthroat trout (*Oncorhynchus clarki*) (0.8%). In the same survey it was reported that both invertebrates and macrophytes were almost absent. In order for DWR to manage the fishery more effectively they treated the reservoir in 1985 and again in 1991 for the remove of rough fish. They have introduced smallmouth bass (*Micropterus dolomieui*), brown trout, and rainbow trout back into the reservoir. Information from annual stocking reports indicates that the reservoir is stocked annually with substantial amounts of fingerling and catchable rainbow trout.



In 1975 the phytoplankton community composition in the reservoir by period of sampling was reported by the EPA included:

May 5,1975		Algal Units per ml
	Diatoma sp.	10,007
	Dinobryon sp.	1,943
	Cyclotella sp.	426
	Cryptomonas sp.	80
	Gymnodinium sp.	80
August 13, 1975		Algal Units per ml
	Mallomonas sp.	489
	Cryptomonas sp.	383
	Chroomonas sp.	349
	Staurastrum sp.	70
	Oocystis sp.	70
September 24, 1975		Algal Units per ml
	Cyclotella sp.	1,635
	Mallomonas sp.	1,372
	Cryptomonas sp.	739
	Euglena sp.	369
	Schroederia sp.	369

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Unknown filamentous green alga	1.634	76.89
Stephanodiscus niagarae		0. 1 7 5 8.28
Pennate diatoms	0.140	6.59
Ankyra judayi	0.055	2.62
M. granulata angustissima		0. 0 2 7 1.31
Asterionella formosa	0.019	0.89
Oocystis sp.	0.016	0.78
Ankistrodesmus falcatus	0.008	0.41
Total	2.073	
Shannon-Weaver [H']	0.93	
Species Evenness	0.42	
Species Richness	0.40	

Piute Reservoir has a relatively diverse phytoplankton community for a low-elevation reservoir, but is dominated by green algae and diatoms indicative of fairly good water quality
.

Pollution Assessment

Nonpoint sources of pollution in the reservoir include: sedimentation, and nutrient loading from grazing in the watershed and in the vicinity of the reservoir; pesticides and fertilizers from cultivated cropland; and wastes and litter from recreation.

There are three point pollution sources in the watershed. All of these are fish hatcheries.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

Information

Bureau of Land Management	
Sevier River Resource Area (Richfield Office)	896-8228
Piute Reservoir and Irrigation Company	
Big Rock Candy Mountain Campground	
Five County Association of Governments???	
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

PIUTE RESERVOIR